WATER CHEMISTRY DATA SHEET

Please check the box next to "Site #" ***if this is a new site and please attach a map.***

☐ Site #_____ Stream_____ County_____

Site Description_____

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Site Description_____

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Site Description_____

Trained Data Submitter (person assuming responsibility for these data)_____

Trained Data Submitter's Stream Team Number_____

Trained Participants_____

	Kit Type Used: (Please circle)	**Site #_____**	**Site #_____**	**Site #_____**
Date				
Rainfall (inches in last 7 days)				
Weather Conditions (cloud cover)				
Time Started (24-hr., military time)				
Air Temperature (°C)				
Water Temperature (°C)				
Dissolved O_2 (mg/L)				
Dissolved O_2 % Saturation				
pH				
NO_3 - N (mg/L) – Nitrate please circle kit type used →	LaMotte - NCR Hach - NI-11 Hach - Pocket Colorimeter			
Conductivity (µS/cm)				
NH_3 - N (mg/L) – Ammonia please circle kit type used →	Hach - NI-8 Hach Cube, Ammonia Hach - Pocket Colorimeter Hach - AccuVac			
PO_4 (mg/L) please circle kit type used →	Hach - PO-19 Hach - PO-24 Hach - Pocket Colorimeter Hach - AccuVac			
Hardness (mg/L)				
Alkalinity (mg/L)				
Turbidity				
Other Parameter (list)	Write in kit type & model #			
Other Parameter (list)	Write in kit type & model #			

Comments (mention any changes from your usual readings) _____

Fish Present (Please Mark) ❑**Yes** or ❑**No**

PLEASE KEEP A COPY AND SEND ORIGINAL DATA TO:

Priscilla Stotts/Water Protection Program
Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

Water Quality Volunteer

Acceptable Ranges for Chemical Parameters

Certain water quality measurements usually tend to fall within a well-defined range. Values outside this range are due to unusual water quality conditions or analyst error. **If any of your water quality measurements fall outside the following range it may be unusual for that stream, so please make two more measurements of that water quality parameter and report all three measurements on the data sheet.**

Water Temperature 0° - 34 °C ***is within the normal range***

Be sure to read water temperature while the thermometer is submerged and shaded.

Dissolved Oxygen 5 – 15 mg/L ***is within the normal range***

Trouble shooting procedure for an unusual DO reading:

1. Check the dates on the packaged chemicals. If outdated, don't use. Please call 800-781-1989 (Stream Team voice mail) to request replacement chemicals.
2. If chemicals are not outdated, repeat the procedure with the following considerations:
   - Be sure to rinse all glassware 3 times in the stream water prior to collecting another sample.
   - It's critical that no air bubbles are in the bottle in steps 2 and 3. If there are, discard sample and start over.
     HINT: Overfill the bottle in Step #1 prior to dropping the stopper in place.
   - If the second result is not within 1 mg/L of the first result, repeat the procedure a third time and report all three readings on your Water Chemistry Data Sheet.

Dissolved Oxygen % Saturation

Use your water temperature and dissolved oxygen reading and determine % saturation using the pink chart in your notebook.

pH 6.5 – 9.0 Standard Units ***is within the normal range.***

1. Always calibrate the pH meter to 7.0 with the yellow, "Buffer solution, pH 7.00 ± 0.02," prior to each sampling event (preferably within 12 hours). Before calibrating, you may want to soak the meter (no deeper than the cap line) overnight in buffer solution or tap water to ensure the bulb is hydrated.
2. To calibrate, turn the meter on using the button on top. Submerge the meter up to the cap line in the calibration solution and adjust the screw labeled pH 7 on the back of the meter with a screwdriver until the pH pen reads 7.0. Do not re-use calibration solution. Since it is a salt you may pour it on the ground or down the drain. Store the meter with a damp piece of paper towel in the cap.

Nitrate (NO_3-N) Nitrogen

1. ***An unusual reading for most streams is one greater than 2 mg/L. If a sampling site is less than 2 miles downstream of a wastewater treatment plant discharge, an unusual reading would be one greater than 10 mg/L.***
2. The nitrate reducing reagent (white powder in brown bottle) has a short shelf life. Be sure to check the expiration date on the label. If the reagent is expired, or becomes clumped or gray, do not use and call for a replacement.

Conductivity

1. Always calibrate the conductivity meter, which has a "3" on the front, with the Sodium Chloride Standard Solution prior to each sampling event (preferably within 12 hours). It should be calibrated to read 1000 µS/cm ±10 µS/cm. Do not re-use calibration solution. Since it is a salt you may pour it on the ground or down the drain.
2. After calibration, turn the meter off, rinse the bottom of the meter and dry the probes. The meter's probes should be stored dry.

Ammonia (NH_3-N)

An unusual reading for most streams is one greater than 2 mg/L. If the sampling site is less than 2 miles downstream of a wastewater treatment plant discharge, an unusual reading would be one greater than 3 mg/L.

Turbidity

When analyzing water for turbidity, be sure to read the sample immediately. If the turbidity tube is full and you can distinguish the black and white pattern on the bottom, enter <10 NTUs.

Do not use any of the multipliers mentioned at the end of the directions found in the chemical kits. Don't feel bad about using up the chemicals in your kit. Please notify us if you need more.

Stream Discharge Worksheet

Stream_____ **County**_____ **Date** ____/____/____ **Time** _____

Site #_____ **Description**_____

Trained Data Submitter_____**Stream Team #**_____

Trained Participants_____

Instructions for Calculation of Stream Discharge (Flow)

Select a section of stream that is relatively straight, free of large objects such as logs or large boulders, with a noticeable current, and with a depth as uniform as possible. Stretch the tape measure provided by the program across the stream. The "0" point should be anchored at the wetted edge of the stream. The end of the tape measure should be anchored at the opposite end so that it is taut and even with the other wetted edge.

Stream Width (Feet)

Step 1: Determine stream cross-sectional area. The first step in determining cross-sectional area is to measure and calculate the average stream depth. In the table below, record depth measurements at one-foot intervals along the tape measure you have stretched across the stream. The depth must be measured in **tenths of a foot** (e.g., 1.7 feet equals one foot and seven tenths). **DO NOT MEASURE DEPTH IN INCHES.**

Record Depth at 1-Foot Intervals					
Interval Number	**Depth in Feet**	**Interval Number**	**Depth in Feet**	**Interval Number**	**Depth in Feet**
1		**11**		**21**	
2		**12**		**22**	
3		**13**		**23**	
4		**14**		**24**	
5		**15**		**25**	
6		**16**		**26**	
7		**17**		**27**	
8		**18**		**28**	
9		**19**		**29**	
10		**20**		**30**	
Sum		**Sum**		**Sum**	

The average depth is calculated by dividing the sum of depth measurements by the number of intervals at which measurements were taken.

Sum of Depths (Feet) ÷ Number of Intervals = Average Depth (Feet)

The final step in calculating the cross-sectional area is to multiply the average depth (in feet) by the stream width (in feet) at the point where the tape measure is stretched across the stream.

Average Depth (Feet) × Stream Width (Feet) = Cross Sectional Area $(Feet)^2$

Step 2: Determine the average velocity for the stream. **For a stream less than ten feet in width,** select three points in the stream approximately equal distances apart for velocity measurements. **For streams greater than ten feet in width,** no fewer than four velocity measurements should be taken at approximately equal distances across the stream. For example, if the stream were eight feet wide, then velocity measurements would be taken at approximately two foot intervals across the stream in order to derive three measurements. If the stream were sixteen feet across, then velocity measurements would be taken at approximately three foot intervals across the stream in order to derive four measurements. This method of measuring the stream velocity will insure that velocity measurements are recorded for the slow and fast portions of the stream.

Once you have determined the number of velocity float trials you need to complete, measure the water's surface velocity in the following manner. Select two points located equal distance upstream and downstream from the tape measure you have stretched across the stream. Determine the distance between these two points and record this value (in feet) in the **Distance Box** on the back of this page. Count the number of seconds it takes a mutually buoyant object (such as a wiffle practice golf ball) to float this distance. Record this time (in seconds) in the table on the back of this page for each float trial you complete.

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Velocity Float Trials	
Trial Number	**Time (Seconds)**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Sum	

Distance Box

Distance Floated (in Feet)

The next step in calculating the surface velocity is to determine the average float time. Average float time is equal to the sum of float times (in seconds) divided by the number of float trials.

Sum of Float Times (Seconds)	÷	Number of Trials	=	Average Float Time (Seconds)

The final step is to divide the distance floated (from the **Distance Box** at top) by the average float time.

Distance Floated (Feet)	÷	Average Float Time (Seconds)	=	Average Surface Velocity (Feet per Second)

Water in a stream does not all travel at the same speed. Water near the bottom travels slower than water at the surface because of friction (or drag) on the stream bottom. When calculating stream discharge, the water's velocity for the entire depth (surface to bottom) needs to be determined. Therefore, you must multiply the average **surface** velocity (from above) by a correction factor to make it represent the water velocity of the **entire stream depth**.

Choose the correction factor that best describes the bottom of your stream and multiply it by the average surface velocity to calculate the corrected average stream velocity.

Stream Bottom Type: Rough, loose rocks or coarse gravel: **correction value = 0.8**
Smooth, mud, sand, or hard pan rock: **correction value = 0.9**

Correction Value	×	Average Surface Velocity (Feet per Second)	=	Corrected Average Stream Velocity (Feet per Second)

Step 3: Calculate the stream discharge. Multiply the cross-sectional area $(Feet)^2$ from **Step 1** by the corrected average stream velocity (Feet/Second) from **Step 2**.

Cross-Sectional Area $(Feet)^2$	×	Corrected Average Stream Velocity (Feet per Second)	=	Stream Discharge $(Feet)^3$ per Second or Cubic Feet per Second (CFS)

Fish Present (Please Mark) **Yes** ❑ or **No** ❑

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Department of Natural Resources
PO Box 176
Jefferson City, MO 65102-0176

Water Quality Volunteer

NEW SITE??

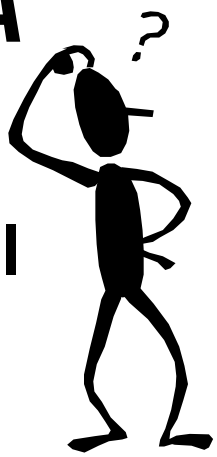
IF SO:

- PLEASE SEND MAP(S)
- MARK MONITORING SITE(S) WITH AN "X"
- IF DATA IS SUBMITTED WITHOUT A MAP, IT WILL DELAY THE ENTRY OF THAT DATA INTO THE *VOLUNTEER WATER QUALITY MONITORING* DATABASES.

Refer to Chapter 6, "*Site Selection & Identification*," in your Introductory VWQM training notebook for instructions on what information to put on the Site Map.

Refer to Chapter 3, "*Visual Survey*," in your Introductory VWQM training notebook for clarification regarding listing "Trained Data Submitters" on your data sheets.

NEED MORE DATA SHEETS?



Just let us know and we'll get some in the mail to you right away!

Call the Stream Team Voice Mail: 1-800-781-1989

OR

Send us an e-mail: streamteam@mdc.mo.gov

OR

Download them off the Stream Team Web site:

http://www.mostreamteam.org

You'll find them under "Stream Team Forms."